

In re SANDERSON et al. -- Appln. No. 09/436,360

**Amendment
1082-370**

REMARKS

Reconsideration and allowance are respectfully requested in view of the following.

Claims 1-13 and 43-47 remain pending in the application.

Double Patenting Rejection

Claims 1-13 and 41-47 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-11 and 31-41 of copending application 09/436,440.

Given the provisional nature of this rejection and the possibility of further claim amendments to this and the co-pending application, it is respectfully requested that this rejection be held in abeyance until the claims of the co-pending application are found allowable. For the time being, this rejection remains traversed.

Claim Rejections -- 35 U.S.C. § 112, second paragraph

Claims 1-13, 41, and 42 have been rejected under 35 U.S.C. § 112, second paragraph, on the ground that the phrases "below about 75°C," "above about -20°C," and "below about 60°C" allegedly render the claims indefinite.

This rejection is traversed.

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As indicated in MPEP § 2173.05(b), the use of relative terminology such as the term "about" in claim language has long been accepted as permissible. Case law suggests that the term "about" may also be used in combination with terms similar to "below" and "above." *See, e.g., W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 U.S.P.Q. 303, (Fed Cir. 1983), *cert. denied*, 469 U.S. 851 (1984) (a limitation defining the stretch rate of a plastic as "exceeding about 10% per second" held definite); *See also Grain Processing Corp. v. American Maize Prods. Co.*, 51 U.S.P.Q.2d 1556, 1559 n.2 (Fed Cir. 1999) (addressing infringement of "descriptive ratio greater than about 2"); *Hybritech, Inc. v. Abbott Labs.*, 7 U.S.P.Q.2d 1191, 1199 (Fed. Cir. 1988).

Thus, the recitation of the term "about" in combination with "above" and "below" -- *i.e.*, "above about" or "below about" -- does not render the claims indefinite. Withdrawal of this ground of rejection is in order.

Claim 4 has been rejected under 35 U.S.C. § 112, second paragraph, as indefinite on the following grounds:

The subject matter of claim 4, as amended, fails to further limit claim 1. Since claim 1 now requires the A blocks to be crystalline below about 60°C, the subject matter of claim 4 is not limiting at temperatures exceeding 60°C. For example, according to claim 1, the A block can be non-crystalline at 61°C; however, claim 4 cannot allow for this possibility, yet it depends from claim 1.

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This rejection is traversed.

It is an axiom of patent law that a claim must be interpreted as it would be by one of ordinary skill in the art. As would be understood by persons of ordinary skill in the art, polyether blocks of the type described in the application have a transition point below which the blocks are crystalline and above which the blocks are amorphous. The *clear and ordinary meaning* of the claim language the "A block being crystalline below about 60°C," as understood by a person of ordinary skill, would have been construed to mean that the A block is crystalline at all temperatures below about 60°C. A person of ordinary skill in the art would understand that if the A block is crystalline at about 60°C, it cannot transition from crystalline to amorphous by lowering its temperature. Likewise, to say that an A block is crystalline below about 75°C means that the A block is crystalline at all temperatures below about 75°C. Again, if the A block is crystalline at about 75°C, it will not transition from crystalline to amorphous by lowering the temperature to about 60°C or lower.

The language "below about 60°C" of claim 1 is broader in scope than the language "below about 75°C" of claim 4. For example, all compounds that are crystalline below about 75°C will also be crystalline below about 60°C.

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However, the converse is not true: a compound may be crystalline below about 60°C, but amorphous between about 60°C and about 75°C.

It is respectfully submitted that all claims are in full compliance with 35 U.S.C. § 112, and that the Section 112, first and second paragraph rejections should be withdrawn.

Claim Rejections -- 35 U.S.C. § 112, first paragraph

Claims 43-47 have been rejected under 35 U.S.C. § 112, first paragraph.

Applicants traverse this rejection, on the ground that it is misplaced. However, in order to expedite prosecution, claim 43 has been amended to address the Examiner's specific concerns. Withdrawal of this rejection is in order.

Claims 41 and 42 have also been rejected under Section 112, first paragraph. Claims 41 and 42 have been cancelled to expedite prosecution of this application by rendering this rejection moot. Withdrawal of this rejection is in order.

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Section 103(a) Rejection of Claims 1-13 and 41-47

Claims 1-13 and 41-47 have been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 4,806,613 to Wardle in view of U.S. Patent No. 4,976,794 to Biddle and U.S. Patent No. 5,747,603 to Hinshaw.

Applicants respectfully traverse the Section 103(a) rejection.

Wardle '613 discloses a method of producing thermoplastic elastomers having alternating A blocks and B blocks. The A and B blocks are both polyethers derived from oxetane, THF, and their derivatives. Examples of suitable oxetanes are listed at column 4, lines 42-61, and are discussed throughout the Wardle '613 patent. As the Examiner acknowledges, the Wardle '613 patent is silent regarding the use of an oxirane-based soft segment.

The Biddle '794 patent discloses laundry lists of soft blocks and hard blocks. Polyglycidyl nitrate and polyglycidyl azide are mentioned at the bottom of the list of soft blocks. The list of soft blocks also mentions "amorphous polyoxetane," of which there are several species. Thus, there are no fewer than fifteen (15) soft blocks listed in the Biddle '794 patent. Of the twenty four (24) hard blocks listed in the Biddle '794 patent, BEMO is the only oxetane.

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Thus, the likelihood of a person of ordinary skill in the art picking a combination of the claimed A blocks and B blocks from those listed in the Biddle '794 patent is approximately 2 in 360, or less than one percent.

In cases where the generality of the reference encompasses many possibilities, the courts have long required that the prior art furnish motivation for singling out particularities within the generalities as a prerequisite to obviousness. This was the holding in *In re Luvisi*, 144 USPQ 646 (CCPA 1965), where the Court cited the following excerpt from the opinion of the Patent Office Board of Appeals in *Ex parte Garvey*, 41 USPQ 583, 584 as being on point:

While the invention here claimed in its broader aspect is doubtless embraced within the speculative teachings of the references, we doubt if references which are not directed to the same purpose and do not have the same inventive concept can be fairly applied in rejecting claims such as those on appeal *where anticipation can be found only by making one of a very great number of possible permutations which are covered by the reference disclosures*. The likelihood of producing a composition such as here claimed from a disclosure such as shown by the Dykstra patent would be about the same as the likelihood of discovering the combination of a safe from a mere inspection of the dials thereof.

(Emphasis in original).

In addition to the low statistical probability described above, there are additional reasons that would have militated against a person of ordinary

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skill in the art picking PGN or GAP from the soft block list and BEMO from the hard block list of the Biddle '794 patent.

The Wardle '613 patent discusses the influence that the reactivity of the oxetanes' primary hydroxyl groups has on the reaction at column 8, lines 48-53, which are reproduced in part below:

The reactivity of the terminal hydroxyl groups varies according to steric factors and also according to side-chain moieties. Energetic oxetanes, for example, generally have side-chain moieties that are electron-withdrawing, making their terminal hydroxyl groups less reactive.

An oxirane ether possesses a secondary hydroxyl group. Persons having ordinary skill in the art would have understood that the electron-withdrawing effect of side-chain moieties of secondary hydroxyl groups is much greater than that of a primary hydroxyl group. In particular, the nitrate ester moiety of glycidyl nitrate has a significant electronic effect on the hydroxyl group, and adversely influences the reactivity of the hydroxyl group. Given the relatively low reactivity of the secondary hydroxyl groups of GAP and PGN, a person of ordinary skill in the art would have been more likely to pick one of the other soft blocks mentioned in the Biddle '794 patent.

Applicants further respectfully submit that the Hinshaw '603 patent would have taught away from selecting PGN or GAP from the soft block list of the Biddle '794 patent for use in the Wardle '613 process. Specifically, the

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Hinshaw '603 patent describes difficulties involved with chain-linking a secondary hydroxyl group of an oxirane:

Also, because the terminal hydroxyl groups of GAP are secondary hydroxyl groups, curing with polyfunctional isocyanates is less efficient than is desirable for achieving good mechanical characteristics of the cured elastomer.

Column 1, lines 57-61.

To achieve good curing, the Hinshaw '603 patent discloses end-capping the non-primary hydroxyl group. The end-capping compound has an hydroxyl-reactive group at one end and a group at the other end which is removable to provide a primary, unhindered hydroxyl group. The hydroxy-terminated polymers are then chain-extended with a diisocyanate.

The end-capping technique of the Hinshaw '603 patent differs from the end-capping technique of the claimed invention, not to mention the end-capping technique of the Wardle '613 patent. Given the teachings of the Hinshaw '603 patent, it is unlikely that a person of ordinary skill in the art would have (i) selected PGN or GAP from the soft block list in the Biddle '794 patent and (ii) end-capped and linked PGN or GAP in the manner taught by the Wardle '613 patent.

For all of these reasons, the Section 103(a) rejection is misplaced, and withdrawal of the same is respectfully requested.

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The claims, as presented herein, are submitted to be in condition for allowance and an early Notice to that effect is requested. In the absence of allowance, entry of the claim amendments is respectfully requested in order to place the application in better condition for appeal.

If, after reviewing the above, the Examiner believes any issues remain unresolved, the favor of an Examiner interview is requested and the Examiner is requested to contact the undersigned, by telephone, to schedule same.

Respectfully submitted,

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I hereby certify that this Amendment is being deposited with the United States Postal Service on May 3, 2002 with sufficient postage as first class mail in an envelope addressed the Assistant Commissioner for Patents, U.S. Patent & Trademark Office, Washington, D.C. 20231.



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IN THE CLAIMS (AS AMENDED):

Kindly cancel claims 41 and 42 without prejudice or disclaimer.

Kindly amend claim 43 as follows:

43. (Once amended) An energetic thermoplastic elastomer having A blocks and B blocks and being present in a solid state suitable for use as a binder for at least one of a propellant, explosive, and gasifier, the energetic thermoplastic elastomer being formulated from a composition comprising, as constituents:

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A blocks terminated with isocyanate-reactive groups derived from monomers comprising at least one member selected from the group consisting of 3,3-(bis(ethoxymethyl)oxetane, 3,3-bis(chloromethyl)oxetane, 3,3-bis(methoxymethyl)oxetane, 3,3-bis(fluoromethyl)oxetane), 3,3-bis(acetoxyethyl)oxetane, 3,3-bis(hydroxymethyl)oxetane, 3,3-bis(methoxyethoxymethyl)oxetane, 3,3-bis(iodomethyl)oxetane, 3,3-bis(nitratomethyl)oxetane, 3,3-bis(methylnitraminomethyl)oxetane, and 3,3-bis(azidomethyl)oxetane), the A blocks being crystalline below about 60°C;

B blocks terminated with isocyanate-reactive groups and comprising at least one member selected from the group consisting of glycidyl azide polymer and poly(glycidyl nitrate), the B blocks being amorphous above about -20°C; and

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linking groups derived from at least one diisocyanate and at least one linking compound comprising two functional groups which are reactive with isocyanate moieties of the diisocyanate.

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IN THE CLAIMS (MARKED-UP VERSION):

Kindly cancel claims 41 and 42 without prejudice or disclaimer.

Kindly amend claim 43 as follows:

43. (Once amended) An energetic thermoplastic elastomer having A blocks and B blocks and being present in a solid state suitable for use as a binder for at least one of a propellant, explosive, and gasifier, the energetic thermoplastic elastomer being formulated from a composition comprising, as constituents:

A blocks terminated with isocyanate-reactive groups derived from monomers comprising at least one member selected from the group consisting of 3,3-(bis(ethoxymethyl)oxetane, 3,3-bis(chloromethyl)oxetane, 3,3-bis(methoxymethyl)oxetane, 3,3-bis(fluoromethyl)oxetane), 3,3-bis(acetoxymethyl)oxetane, 3,3-bis(hydroxymethyl)oxetane, 3,3-bis(methoxyethoxymethyl)oxetane, 3,3-bis(iodomethyl)oxetane, 3,3-bis(nitratomethyl)oxetane), 3,3-bis(methylnitraminomethyl)oxetane, and 3,3-bis(azidomethyl)oxetane, the A blocks being crystalline below about 60°C;

B blocks terminated with isocyanate-reactive groups and comprising at least one member selected from the group consisting of glycidyl azide polymer and poly(glycidyl nitrate), the B blocks being amorphous above about -20°C; and

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linking groups derived from at least one diisocyanate and at least one linking compound comprising two functional groups which are reactive with isocyanate moieties of the diisocyanate.